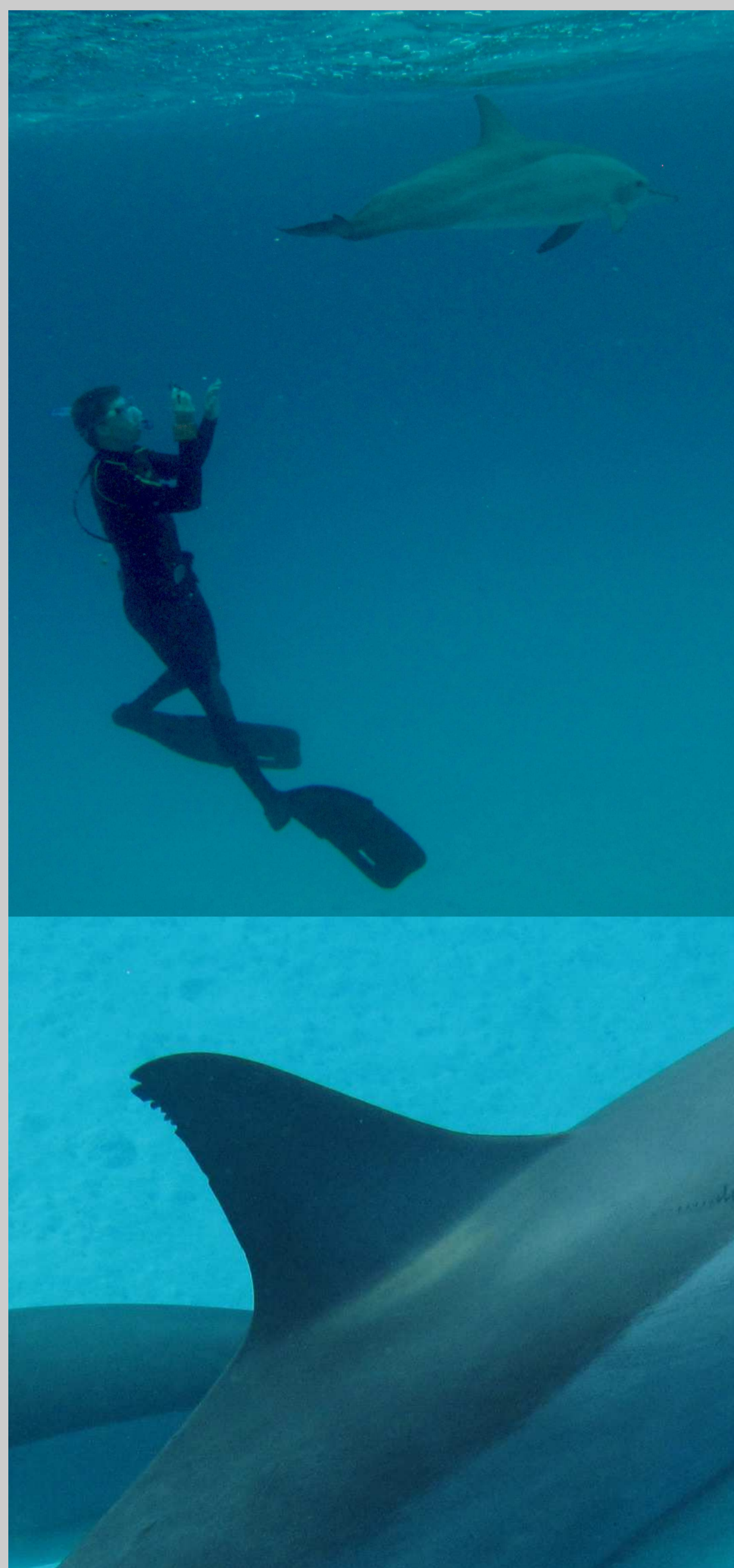


Site fidelity and relative abundance of spinner dolphins resting in Samadai reef (Egypt - Red Sea)



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INTRODUCTION

Spinner dolphins *Stenella longirostris* are known to spend daylight hours in protected and shallow areas, after having foraged at night in offshore waters (1). Off the southern Egyptian Red Sea coast, Samadai reef is very often visited by spinner dolphins. Since 2004 a management plan (2) has come into force to regulate touristic activities involving interaction with dolphins. One-year study was conducted after the implementation of the management plan: the results are reported below.

METHODS

Between October 2005 and September 2006 the reef was visited 107 times resulting in 81 dolphin encounters and 72 underwater photo-identification sessions (15,822 pictures). Mark recapture analysis (3) have been performed (with Program MARK) on highly marked individuals using

only pictures of high quality (about 50% of total photos). A total of 60 sightings were considered for the analysis and pooled in 8 occasions. The best model and detection function were selected with the lowest Akaike's Information Criterion (AIC). QAIC (with a median $\chi_{hat}=2.9607$) was used to compare results in Cormack-Jolly-Seber (CJS) and POPAN open models. The proportion of marked animals θ was estimated from the proportion of photos with marked and unmarked dolphins in each encounter.

RESULTS

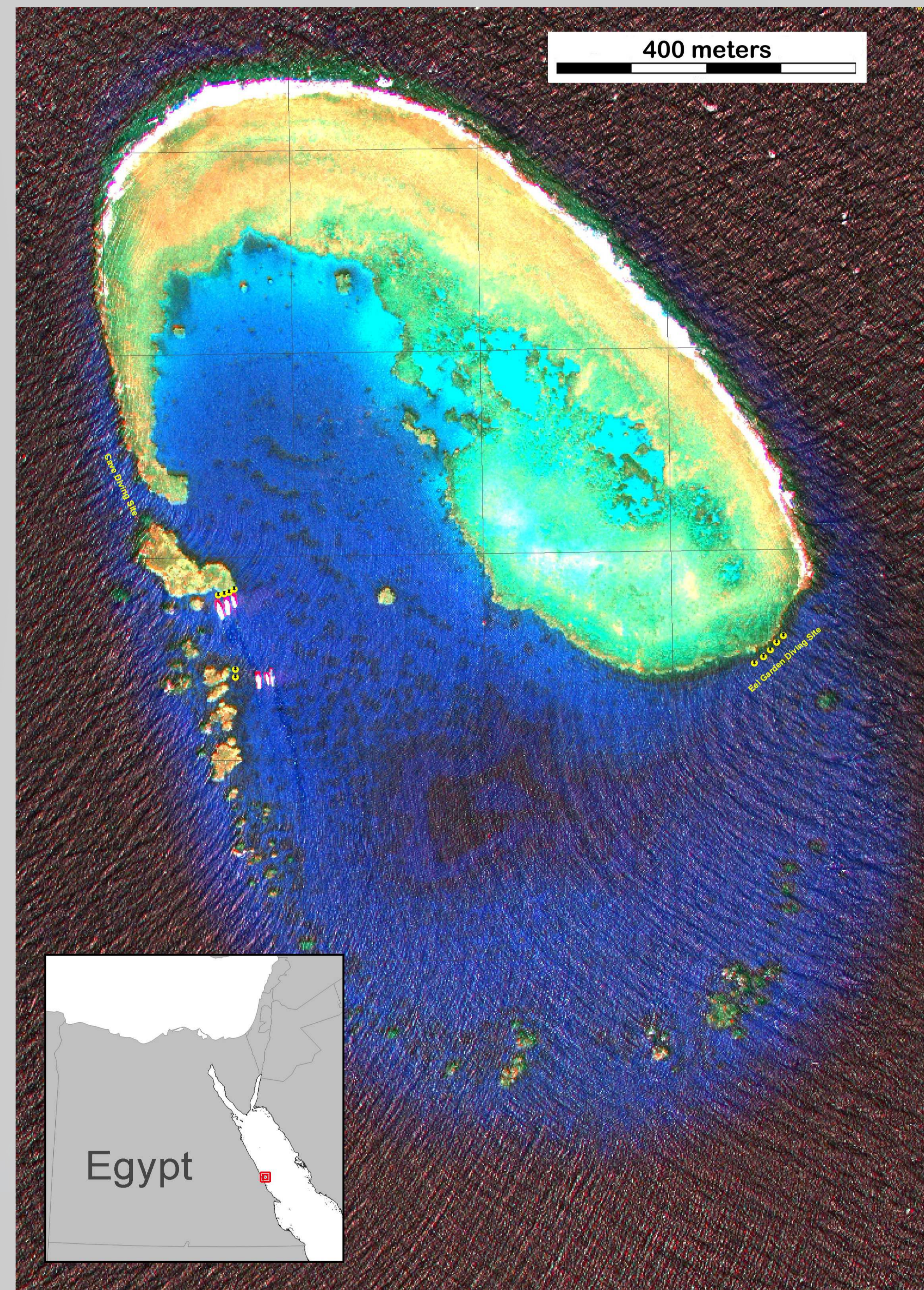
Dolphins were present the 76% of the time (with an average of 6h/day), with group sizes ranging from 3 to 170 (median=55; mean=58; SE=36.6; n=60). Survival estimation values were very high ($\Phi > 0.9$) all year-round for the majority of animals (60%). Goodness of fit testing showed evidence of transience, and the Time-Since-Marking (TSM) CJS models ascribed the effect to the male individuals. The Robust Design (Closed Models) indicated then that a small group of migrant dolphins follows a pattern in their movement in-out the reef (Markovian models), while the rest shows a random temporary emigration (Table 1). Finally POPAN formulation returned estimation values for the population (Table 2).

Table 1 - Comparison between the two best Robust Design Closed models. S: apparent survival; g,g',g'': prob. of TE; p/c: prob. of capture/re-capture.

Model (.)=constant; (t)=time	AICc	Delta AICc	AICc Weight	N. Par.	Deviance
S(.) g(.) p=c(t) N(t)	1222.55	0	0.6074	70	3145.95
S(.) g'(.). g'(.). p=c(t) N(t)	1223.83	1.282	0.3200	71	3144.87

Table 2 - Comparison between the two best POPAN models and population estimations (N_{hat}) corrected for θ value. Phi: prob. survival; p: prob. of recapture; pent: prob. of recruitment.

Model (t)=time	QAICc	Delta AICc	AICc Weight	N. par.	N _{hat} (N _{hat})	SE (N _{hat})	N _{hat} (θ)	95%CI
Phi(t) p(Days) pent(t) N	354.81	0	0.9361	17	163	6.9	481	442-522
Phi(t) p(N.sight) pent(t) N	361.63	6.821	0.0309	17	159	5.1	469	439-498



Samadai reef, situated 4 Nm off the southern Red Sea Egyptian coast (Marsa Alam area, 24°59' N ; 034°59' E).

CONCLUSIONS

With one year of data available, our conclusions are preliminary. The large number of animals (~500) that seems to use the area is unanticipated considering the small size of the lagoon (350x400m). Although the models indicate that some dolphins are migrants, the majority shows a high rate of year-round residency, confirming the essential role that Samadai reef plays for the species in the northern Red Sea. In June 2011 a new project began with the aim of studying population trends, social structure, patterns in group size and composition and to monitor the interaction between dolphins and tourism activities (in particular swimming-with-dolphins).

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